

# MISSOURI MONTHLY VITAL STATISTICS

## *Provisional Statistics*

From The

MISSOURI DEPARTMENT OF HEALTH & SENIOR SERVICES  
CENTER FOR HEALTH INFORMATION MANAGEMENT & EVALUATION  
JEFFERSON CITY, MISSOURI 65102-0570  
(573) 751-6272

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## **Focus...Missouri 2001 Prenatal Drug Prevalence Study**

The Missouri Department of Health and Senior Services is mandated to conduct periodic statewide drug prevalence studies to determine the extent of tobacco, alcohol and illegal substance use during pregnancy. This charge is the result of legislation passed in 1991, (191.725-191.745, RSMO) which addressed assessment, education, and referral for drug usage during pregnancy. What follows are the results of the 2001 study with a comparison to the initial 1993 study and the 1997 follow-up study.<sup>(1-2)</sup> All three studies had the same overall design to facilitate comparison.

### **Methods**

The double-blind study was set up so that the subjects did not know they were being screened and neither the hospitals' personnel nor researchers could find out who screened positive, as no personal identifiers were used on samples or forms. Also, the names of participating hospitals were kept confidential. The study was approved by the Missouri Department of Health and Senior Services - Institutional Review Board (IRB) with a waiver for the informed consent process because of its anonymous design. Some of the hospitals requested to participate in the study also had their Institutional Review Boards review the study.

### *Participants and Research Design*

A statewide sample of delivering women was secured utilizing a multi-stage probability proportional to size sampling design. Using events

from July 1999 through June 2000, 62 non-military hospitals in Missouri expected to experience a minimum of 200 deliveries in 2001 were selected for the sampling frame. These hospitals represented approximately 93 percent of the Missouri resident births during that time period.

The state was divided into three major regions. Within each region, probability proportional to size sampling<sup>(3-4)</sup> was performed to randomly select nine hospitals from the St. Louis metro region, six from the Kansas City metro region and ten from the remaining out-state region. Before the randomly selected hospitals were acquired, one hospital in the Kansas City metro, one in out-state and two in the St. Louis metro regions were pulled out and included in the study as self-representors because of the likelihood that their obstetrical population would include a higher rate of cocaine users. Information from the 1993 and 1997 prenatal drug prevalence studies along with the birth certificate information on the percent of no prenatal care was used to make the selection of self-representor hospitals. No prenatal care has been one of the key indicators for illegal drug usage. One hundred mothers were selected from each randomly selected hospital except for the four hospitals included as self-representors, from which two hundred mothers were selected, and certain other very large hospitals (i.e., hospitals with expected number of deliveries larger than the sampling interval initially used to select the random hospitals), from which a number

(continued on next page)

larger than 100 was required to adequately represent the hospital's maternal population.

An attempt was made to acquire a total of 3,540 urine samples from 29 hospitals. Only 26 hospitals agreed to participate with eight of these 26 being alternates. An attempt was made to ensure that all alternate hospitals were as similar in obstetrical patient mix as the hospitals they replaced. One of the self-representor hospitals in the St. Louis metro region declined and there was not another hospital in the region having the same patient mix nor likelihood in cocaine usage. Another hospital in the St. Louis metro region only captured 78 percent of the needed sample and five of the metro regions' final hospitals were alternates. Two hospitals in the Kansas City metro region (one providing high risk obstetrical services) declined to participate and one of the participating hospitals was an alternate. Eleven hospitals in out-state Missouri participated with two being alternates. Even though the Department of Health and Senior Services is mandated under statute to conduct drug prevalence studies there is nothing in the statute saying that hospitals or corporations owning hospitals must cooperate.

The study sample represented 57.1 percent of the recorded births and fetal deaths for the hospitals involved during their respective study periods. The final sample was not completely representative of the population of women delivering at the hospitals included in the sampling process when compared on the basis of recorded birth and fetal death records for that time period. The final sample under-represented black mothers by 20 percent, women having low birth weight infants by 28 percent (41 percent for black women), and 8 percent for Medicaid participants. The final maternal chart/urine sample size was 3,048 versus 3,096 for 1997 and 2,008 for 1993.

Data and urine specimens were collected during the period March through November 2001. The study population was to include all women admitted consecutively for delivery at each of the participating hospitals, with pregnancies of 20 weeks or more gestation. Two hospitals in the St. Louis metro region had over 900 deliveries apiece

before they acquired their needed samples with one still being short their 100 specimens by 22 percent. Two Kansas City metro region hospitals had over 300 deliveries apiece before they acquired their needed samples. The out-state region had one hospital with over 400 deliveries and one with over 300 deliveries during the time they were collecting samples. Each hospital was to initiate sample collection on a specified date with significant overlap of collection periods occurring among most hospitals. Because of this lack of following the study protocol and key hospitals declining to participate; comparisons with the linked hospital patient abstract (mom)/birth-fetal death certificate file results will be made where possible for certain key factors previously found to be associated with drug usage.

### *Measures*

A portion of the routine urine specimen collected after admission for delivery was obtained for analysis. Demographic data; obstetrical history, including self-reported use of alcohol, tobacco and other drugs (licit and illicit) during pregnancy; prenatal care status and delivery information were acquired from the obstetrical floor charts and/or normal intake interviews. Additional information included delivery outcome, birth weight and gestational age.

All urine specimens were analyzed in a laboratory certified by the National Institute on Drug Abuse (University of Missouri, Toxicology Laboratory, Columbia, MO). Laboratory personnel received specimens labeled only with the coded identifiers. Urine was sampled for heroin (am6), marijuana (cannabinoids), cocaine, cotinine/nicotine, amphetamines and phencyclidine (PCP). For the 2001 study, barbiturates and benzodiazepines were dropped because of cross-reactivity and ethanol was dropped because of a very short detection time. Opiates detection was changed to just heroin (am6). As with the 1997 study, all 2001 positive screens for illegal drugs were confirmed by gas chromatography/mass spectrometry whereas for 1993 confirmation was completed for a sample of positive screens. Because of very low detection rates for some drugs, as with the previous studies, only the four major

substances (i.e., alcohol, tobacco, cocaine and marijuana) are discussed in detail.

Drug detection times vary widely with most illegal drugs traceable in urine a minimum of three days following their use with heavy users of marijuana remaining positive for up to two weeks after cessation. Because of the short detection time for the reviewed illegal drugs, these results under report the actual usage during pregnancy.

The Sinclair School of Nursing - University of Missouri was contracted to monitor the data and urine collection processes. This included quality control for the information and urine specimens collected and assuring that the hospitals were following the study protocol.

Expansion weights were developed at the hospital level to represent that hospital's deliveries for one year and to account for over/under-sampling. Post-stratification was utilized to adjust the sample's racial (black, non-black), birth weight (LBW, not LBW) and pregnancy outcome type (live birth, fetal death) distribution of deliveries to those of the population in the region and state for

2001. SUDAAN Version 8.0 for PC<sup>(5)</sup> was used to calculate the weighted prevalence estimates and sampling errors, taking the sampling design into account for all studies. The Z-test for significance of the difference between two proportions adjusting for the design effect was used to test for prevalence differences between groups.

## Results

Table 1 shows a significant decrease between 1993 and 1997 and again between 1997 and 2001 in estimated prevalence of cocaine (urine specimen) usage just prior to delivery, with decreases of 46 and 57 percent respectively. This same pattern of decreasing prevalence of cocaine usage is found using the linked hospital patient abstract (mother's record)/birth file over the 1993 to 2000 time period. A significant decrease between 1993 and 1997, and 1993 and 2001 in estimated prevalence of alcohol (chart abstraction) usage was noted. The prevalence of marijuana (4.3 versus 3.8 percent) and amphetamines (.25 versus .11 percent) showed slight decreases between 1997 and 2001, while phencyclidine (PCP) remained constant at .03 percent. No heroin cases were detected for either the 1997 or 2001 study. The 1993 and 1997 studies

**Table 1. Overall Prevalence of Prenatal Drug Exposure:  
Missouri 1993, 1997 and 2001 Substance Abuse Studies**

Drug	1993				1997				2001			
	Chart		Urine		Chart		Urine		Chart		Urine	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Alcohol	7.9	1.3	NTF		3.6**	0.8	1.6	0.6	3.2**	1.1	NTF	
Tobacco	22.5	3.4	21.9	3.6	21.7	3.3	21.0	3.1	17.3	2.8	21.6	3.1
Marijuana	1.3	0.5	4.0	1.1	1.6	0.6	4.3	1.0	1.6	0.6	3.8	0.8
Cocaine	1.1	0.5	1.3	0.6	0.7	0.3	0.7**	0.1	0.3	0.2	0.3***	0.3
Opiates/Heroin	NCR		2.2	1.0	0.01	0.02	NCU		0.05	0.07	NCU	
Amphetamines	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.1	0.1
Phencyclidine (pcp)	NCR		0.02	0.04	0.01	0.02	0.03	0.04	0.02	0.03	NTF	
<b>Number</b>	<b>2,213</b>		<b>2,213</b>		<b>3,096</b>		<b>3,096</b>		<b>3,048</b>		<b>3,048</b>	

95% CI - 95 percent confidence interval

NTF - Not tested for in urine

NCR - No cases reported on chart

NCU - No cases found in urine samples

\*\* - Statistically significantly lower than the 1993 estimate.

\*\*\* - Statistically significantly lower than the 1997 estimate.

tested for opiates instead of heroin so previously found results were suspect because of potential for misleading ascertainment (prescription medication instead of illegal drug usage).

The prevalence of tobacco usage as measured by urine cotinine showed no real change from 1993 to 1997 and to 2001. This is in contradiction to chart abstraction (self-report), which showed a decrease of over 23 percent between 1993 and 2001. For 2001, urine cotinine noted 21.6 percent usage versus 17.3 from chart abstraction and 16.2 for birth certificates for the study hospitals during the study period.

As in 1997, there was significant variation in substance usage between race/ethnic groups in 2001, with Hispanics having the lowest prevalence for three of the four reviewed substances (See Table 2). Non-Hispanic white women had significantly higher prevalence of tobacco usage than the other two groups, while non-Hispanic white and non-Hispanic black women had significantly higher marijuana prevalence rates than Hispanics. The highest prevalence rate for alcohol was noted for non-Hispanic white women and the highest for cocaine was noted for non-Hispanic black women with no difference for either substance being statistically significant.

**Table 2. Weighted Race/Ethnic Group Prevalence of Prenatal Drug Exposure: Missouri Prenatal Substance Abuse Study 2001**

<b>Drug</b>	Non-Hispanic White		Non-Hispanic Black		Hispanic	
	Percent	95% CI	Percent	95% CI	Percent	95% CI
Alcohol	3.4	1.3	2.6	1.3	1.6	2.1
Tobacco	23.3**	3.3	14.9	5.2	10.2	5.5
Marijuana	4.0*	1.0	4.1*	2.1	0.5	1.0
Cocaine	0.2	0.2	1.1	1.4	0.5	1.0
<b>Number</b>	<b>2,337</b>		<b>488</b>		<b>90</b>	

95% CI - 95 percent confidence interval

\*Prevalence is significantly higher ( $p < 0.05$ ) than that for Hispanics

\*\*Prevalence is significantly higher ( $p < 0.05$ ) than that for both Non-Hispanic Black and Hispanics

Alcohol - chart abstraction only

Table 3 shows prevalence estimates in relation to age. In all cases but cocaine, the highest prevalence estimates are noted for the under 20-age group. This is in contrast to 1997 results when the highest prevalence estimates for all but cocaine were noted for the age group 20-24. The highest cocaine usage was noted for the 25-29 age group, while in 1997 it was noted for the 30 or over age group. In 2001, no cocaine usage was detected for those women under age 25, while in 1997 no cocaine usage was noted for those under age 20. The trend by age for cocaine usage does not reflect

all race/ethnic groups because of differences by race groups. For non-Hispanic black women, the estimate of cocaine usage increases from zero for ages under 25 to 5.5 percent for women in the age group 25-29, and then decreases to 0.3 percent for the 30 or over age group. The 1997 study presented different results for non-Hispanic black women, showing increasing usage with age, with the 30 and over age group having a rate of 10 percent. This pattern of increasing usage with increasing age is evident for 1993, 1997 and 2000 from the hospital patient abstract (mother's

**Table 3. Weighted Age-Specific Prevalence of Prenatal Drug Exposure:  
Missouri Prenatal Substance Abuse Study, 2001**

Drug	Mother Age							
	Under 20		20 - 24		25 - 29		30 or Older	
	Percent	95% CI	Percent	95% CI	Percent	95% CI	Percent	95% CI
Alcohol	4.9	2.4	3.4	1.6	2.9	1.8	NCR	
Tobacco	32.8*	6.4	25.8*	4.8	20.1*	3.0	14.7	3.6
Marijuana	5.2**	2.0	5.2*	1.0	3.0	1.4	2.8	1.0
Cocaine	0		0		0.9	0.9	0.2	0.2
<b>Number</b>	<b>401</b>		<b>876</b>		<b>847</b>		<b>918</b>	

95% CI - 95 percent confidence interval

NCR - No cases reported on chart

\*Prevalence is significantly higher ( $p < 0.05$ ) than that for older age group(s).

\*\*Prevalence is significantly higher ( $p < 0.05$ ) than that for mothers age 30 or older.

Alcohol - chart abstraction only

records)/birth files (2001 files is not yet linked). The 2000 linked file shows non-Hispanic black rates of 0.15, 0.24, 1.2 and 4.2 percent for ages under 20, 20-24, 25-29 and 30 and over, respectively. The linked file shows decreases for non-Hispanic black cocaine usage for all but the under 20-age group from 1993 through 2000.

The trend by age for tobacco usage also varies among the race/ethnic groups. For the non-Hispanic white women there is a pattern of decreasing usage with increasing age. However for non-Hispanic black women, tobacco usage is highest in the 25-29 age group (18.7 percent), followed by the under 20-age group (15.4 percent). This pattern was not observed in the 1997 study, which showed a steady increase in tobacco usage with increasing age for non-Hispanic black women. Non-Hispanic blacks under the age of 20 showed a 185 percent increase in tobacco usage from 1997 (5.4 percent) to 2001 (15.4 percent).

The overall tobacco prevalence as measured by urine cotinine for the under age 20 group increased from 23.2 percent in 1997 to 32.8 percent in 2001. This increase is basically reflective of the increase

in tobacco usage for the non-Hispanic whites, which increased from 30.3 percent to 40.7 percent during this time period. Not much change was noted for the other non-Hispanic white age groups.

Table 4 shows for the three areas of Missouri (St. Louis metro region, Kansas City metro region and out-state region) reviewed there were no statistically significant differences in substance usage. Higher alcohol and tobacco prevalence rates were noted for out-state Missouri than the metro regions, with the reverse being the case for marijuana. The Kansas City metro region recorded the highest cocaine usage rate. However the linked hospital patient abstract/birth file for 2000 shows little difference between Kansas City and St. Louis City Metro region cocaine usage with 1.1 and 1.3 percent usage respectively. Compared to the 1997 study, alcohol showed an increase in Kansas City metro and out-state regions; whereas, tobacco usage showed an increase in only the Kansas City metro region. Marijuana usage showed an increase in the Kansas City metro region and decreases in out-

**Table 4. Weighted Region-Specific Prevalence of Prenatal Drug Exposure:  
Missouri Prenatal Substance Abuse Study, 2001**

<b>Drug</b>	St. Louis Metro		Kansas City Metro		Outstate	
	Percent	95% CI	Percent	95% CI	Percent	95% CI
Alcohol	2.3	1.1	2.8	1.9	4.2	2.5
Tobacco	19.7	5.4	20.5	5.1	24.0	5.1
Marijuana	4.4	1.2	4.7	2.0	2.8	1.3
Cocaine	0.3	0.4	0.9	0.9	0	
<b>Number</b>	<b>1,213</b>		<b>592</b>		<b>1,243</b>	

95% CI - 95 percent confidence interval  
Alcohol - chart abstraction only

state Missouri. Cocaine usage showed a decrease from 1.0 percent in 1997 to 0.3 percent in 2001 for the St. Louis metro region. The linked file also showed a decrease in cocaine usage for the St. Louis Metro region, however for 1997 and 2000 the rates were higher, 2.1 and 1.3 percent respectively, than what was found in the 1997 and 2001 drug prevalence studies using urine specimens.

As with the prior studies, Table 5 shows "no prenatal care" as one of the major indicators of

whether a women was using one or more of the four substances, with the 2001 results not being as dramatic as for the prior two studies. A potential reason for this difference with the prior studies in the association of substance usage with "no prenatal care" could be the non-participation of one of two St. Louis Metro region major hospitals which were pre-selected because of prior knowledge of clientele drug usage. The hospital, which declined to participate in the 2001 study, accounted for nearly 40 percent of the region's women receiving

**Table 5. Weighted Prenatal Care-Specific Prevalence of Prenatal Drug Exposure:  
Missouri Prenatal Substance Abuse Study, 2001**

<b>Drug</b>	Trimester Prenatal Care Began						No Care	
	First		Second		Third			
	Percent	95% CI	Percent	95% CI	Percent	95% CI	Percent	95% CI
Alcohol	2.6	1.1	5.8*	3.1	3.0	5.1	9.0	11.5
Tobacco	20.9	3.3	22.8	3.7	21.0	15.4	36.7	20.1
Marijuana	3.3	0.9	5.2	2.3	6.3	5.7	15.2	12.4
Cocaine	0.2	0.3	0.06	0.12	0		1.3	2.6
<b>Number</b>	<b>2,244</b>		<b>471</b>		<b>115</b>		<b>30</b>	

95% CI - 95 percent confidence interval

\*Prevalence is significantly higher ( $p < 0.05$ ) than that for the first trimester group, only.

Alcohol - chart abstraction only

"no prenatal care" and nearly 30 percent of the women participating in Medicaid during 2001. Table 5 also shows that no significant discernable differences by trimester were noted for tobacco or cocaine usage. Marijuana was the only substance showing an inverse relationship with prenatal care usage. No urine specimens tested positive for cocaine for women starting prenatal care in the third trimester. Prevalence rates were also calculated for expected payment source (Table 6) and prior live births (Table 7). Women in the Medicaid group or Medicaid MC Plus subgroup had significantly higher prevalence of alcohol, tobacco and marijuana usage than the private insurance group. Women having Medicaid or MC Plus as the expected pay source also had significantly higher usage of tobacco and marijuana than the self-pay group. The 1997 study showed significantly higher rates for all four reviewed substances for the Medicaid group than the private insurance group. No discernable difference in alcohol, marijuana and cocaine usage was detected by birth order. Women having their fourth or higher order birth were significantly more likely to use tobacco than women having their second birth. The highest rate of marijuana and cocaine usage was noted for those mothers having their fourth or higher order birth.

## Summary

All of the substances evaluated, including alcohol and tobacco, adversely effect pregnancy outcomes. The most prevalent substance used during pregnancy in 1993, 1997 and 2001 was tobacco, with estimated prevalence of more than one-in-five for all three periods. The 1997 to 2001 increase in tobacco prevalence for pregnant teens for both Non-Hispanic whites (30.3 to 40.7 percent) and Non-Hispanic blacks (5.4 to 15.4 percent) is of particular concern. This points to the need for increased efforts at smoking avoidance and cessation activities (e.g., increased sales tax on cigarettes, school programs, enforcement and counter-marketing).

Also of concern is the increase in denial of tobacco usage by women at the time of delivery. The urine cotinine measure showed a pattern of no change in tobacco usage for the 1993 through 2001 period while chart review (self-report) showed a decrease of over 23 percent for the same time period for the same women. A similar decrease in tobacco usage is noted from birth certificate data for the study hospitals. This further demonstrates the need for using a bio-marker to measure change in tobacco usage. Smoking cessation studies without a bio-marker are suspect. Even though the

**Table 6. Weighted Expected Payment Source-Specific Prevalence of Prenatal Drug Exposure: Missouri Prenatal Substance Abuse Study, 2001**

Drug	Expected Pay Source									
	Private Insurance		Medicaid Non-MC+		Self - Pay		Medicaid MC+		Total Medicaid	
	Percent	95% CI	Percent	95% CI	Percent	95% CI	Percent	95% CI	Percent	95% CI
Alcohol	2.12	1.2	4.1	2.7	2.3	3.6	5.8*	2.5	5.1*	2.3
Tobacco	16.2	3.0	32.6**	5.3	13.2	9.4	33.3**	7.0	33.0**	5.0
Marijuana	2.8	1.0	4.3***	2.0	1.1	1.6	7.4**	2.4	6.1**	1.6
Cocaine	0.3	0.3	0		0		0.7	1.0	0.4	0.6
<b>Number</b>	<b>1,815</b>		<b>451</b>		<b>63</b>		<b>657</b>		<b>1,108</b>	

95% CI - 95 percent confidence interval

\*Prevalence is significantly higher ( $p < 0.05$ ) than that for the Private Insurance group.

\*\*Prevalence is significantly higher ( $p < 0.05$ ) than that for both Private Insurance and Self-Pay.

\*\*\*Prevalence is significantly higher ( $p < 0.050$ ) than that for the Self-Pay group.

Alcohol - chart abstraction only

**Table 7. Weighted Birth Order-Specific Prevalence of Prenatal Drug Exposure:  
Missouri Prenatal Substance Abuse Study, 2001**

<b>Drug</b>	First Born		Second Born		Third Born		Fourth or Higher Order	
	Percent	95% CI	Percent	95% CI	Percent	95% CI	Percent	95% CI
Alcohol	3.4	1.5	3.8	1.6	1.7	1.2	2.6	2.1
Tobacco	20.5	3.6	20.8	3.8	24.5	5.1	24.3*	6.0
Marijuana	3.2	1.2	4.2	1.6	4.2	1.9	4.9	2.6
Cocaine	0.1	0.2	0.4	0.5	0.07	0.1	1.5	2.2
<b>Number</b>	<b>1,235</b>		<b>1,004</b>		<b>478</b>		<b>307</b>	

95% CI - 95 percent confidence interval

\*Prevalence is significantly higher ( $p < 0.05$ ) than that of the Second Born group.

Alcohol - chart abstraction only

detection time for urine cotinine is short it will pick up those women who are currently smoking and therefore expose those in denial.

The cocaine prevalence rate showed a significant decrease from 1993 to 1997 and then to 2001. A significant decrease in alcohol usage (chart review only) was observed between 1993 and 1997 and then a non-significant decrease for 2001. Non-significant change between 1997 and 2001 was also noted for the other tested substances.

This study as well as the 1997 study found that Hispanics had the lowest prevalence for all four substances reviewed by race/ethnic group. As noted in the previous studies, non-Hispanic white women had the highest rate of tobacco usage. Marijuana usage was significantly higher for non-Hispanic white and non-Hispanic black women than for Hispanic women. Alcohol usage was recorded as highest for non-Hispanic white women and cocaine usage for non-Hispanic black women.

Results of this study, mostly as they relate to overall cocaine usage and in particular for the St. Louis Metro region are probably underestimated. This is because of the lack of participation of one

key hospital in that area and two other hospitals elsewhere, the overall number of alternate hospitals statewide, and hospitals not following protocol in acquiring participants. However, the observed downward trend in cocaine usage is supported by the other presented evidence from the linked hospital abstract/birth data set.

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## Provisional Vital Statistics for August 2002

**Live births** increased sharply in August as 8,559 Missouri infants were born compared with 6,210 one year earlier. Most of this increase is probably due to irregular reporting. Cumulative births for the 8- and 12- month periods ending with August also show increases.

**Deaths** also increased in August as 5,506 Missourians died compared with 4,716 in August 2001. Cumulative deaths for the 8- and 12- month periods ending with August also show increases.

The **Natural increase** for August was 3,053 (8,559 births minus 5,506 deaths). For the 8- and

12- month periods ending with August, the natural increase declined.

**Marriages** increased in August, but show slight decreases for the 8- and 12- month periods ending with August. **Dissolutions of marriage** also increased in August, but decreased for the cumulative periods ending with August. The marriage to divorce ratio increased from 1.75 to 1.84 for the 12 months ending with August.

**Infant deaths** increased for all three time periods shown below. For the 12 months ending with August, the infant death rate increased from 7.6 to 8.3 per 1,000 live births.

### PROVISIONAL VITAL STATISTICS FOR AUGUST 2002

Item	<u>August</u>				<u>Jan.-Aug. cumulative</u>				<u>12 months ending with August</u>				
	<u>Number</u>		<u>Rate*</u>		<u>Number</u>		<u>Rate*</u>		<u>Number</u>		<u>Rate*</u>		
	<u>2001</u>	<u>2002</u>	<u>2001</u>	<u>2002</u>	<u>2001</u>	<u>2002</u>	<u>2001</u>	<u>2002</u>	<u>2001</u>	<u>2002</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>
<b>Live Births</b> .....	6,210	8,559	13.4	19.0	50,715	52,007	13.6	13.9	75,341	76,821	14.0	13.4	13.6
<b>Deaths</b> .....	4,716	5,506	10.2	12.2	37,334	40,146	10.0	10.7	54,115	57,139	9.9	9.6	10.1
<b>Natural increase</b> ....	1,494	3,053	3.2	6.8	13,381	11,861	3.6	3.2	21,226	19,682	4.1	3.8	3.5
<b>Marriages</b> .....	3,852	4,606	8.3	10.2	28,144	28,118	7.5	7.5	42,264	42,060	8.0	7.5	7.4
<b>Dissolutions</b> .....	1,918	2,032	4.1	4.5	15,906	15,238	4.3	4.1	24,093	22,890	4.5	4.3	4.0
<b>Infant deaths</b> .....	45	64	7.2	7.5	420	456	8.3	8.8	574	640	7.7	7.6	8.3
<b>Population base</b> ..... (in thousands)	...	...	5,630	5,665	...	...	5,630	5,665	...	...	5,579	5,619	5,654

\* Rates for live births, deaths, natural increase, marriages and dissolutions are computed on the number per 1000 estimated population. The infant death rate is based on the number of infant deaths per 1000 live births. Rates are adjusted to account for varying lengths of monthly reporting periods.

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